

REMARKS/ARGUMENTS

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph because the phrase "may be" renders the claims indefinite. In response, the applicants believe that the Examiner was referring to the terms "may vary" and, accordingly, the language of claim 1 has been amended to overcome this rejection.

Claims 1-2, 5-7 and 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ferdows (5,184,474). Further, claims 3-4 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ferdows. In response, the applicants have reviewed that reference in detail and believe that the present invention as now claimed is patentably distinctive thereover for the reasons discussed hereinbelow.

The present invention relates to a bus rooftop air conditioning system having a plurality of self-contained air conditioning modules with each having its own hermetic compressor. Ideally, a single large compressor would be preferred over a plurality of smaller compressors, but the diameter thereof is limited by the permitted height above the rooftop. That height is 200 mm. Therefore, the most important determinant of how many modules are provided on the rooftop to meet the total capacity of air conditioning required, is the capacity of the compressor(s) having a diameter that meets the minimum height requirements.

Another desirable feature in the design of the present invention is the use of a hermetic compressor rather than an open drive arrangement. The hermetic compressor substantially reduces the likelihood of leakage from the required seals, but presents problems with respect to lubrication of the compressor. Firstly, in the development of hermetic compressor, it took many years before a hermetic compressor was devised for a horizontal rather than a vertical disposition. Secondly, even then, as discussed in the applicant's specification, the applicants found that lubrication problems could occur when the bus was going up or down a hill because the lubrication settled in one end of the compressor. It was for this reason that the applicants arrived at the solution of placing the hermetic compressor with its axis disposed transversely to the bus rooftop, even though, the more obvious approach

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would have been to have the compressor disposed in a fore and aft position because of limited space in a transverse direction of the condenser section.

The Ferdows reference shows a rooftop air conditioning system wherein a single self-contained module is provided with a condenser compartment, an evaporator compartment, and a compressor compartment therebetween. Within the compressor compartment there is provided an open drive arrangement with the drive motor 17 mechanically connected to the compressor 16, with the two having their axes orientated transversely of the bus. The purpose of such an arrangement was not because of lubrication concerns since this was not a problem for an open drive system. Rather, because the compressor was placed between the evaporator and condenser compartments, there was excess space in the transverse direction and such an arrangement allowed for the longitudinal length of the compressor compartment i.e. the distance between the condenser and evaporator compartments, to be minimized.

In view of the above discussion, the now recited feature of the applicant's invention in having a horizontally disposed hermetic compressor should be seen as significantly different from that of the open drive compressor arrangement as shown by Ferdows. Further, the teaching of Ferdows of providing a transversely disposed open drive compressor arrangement for the purpose of economy and space should not render obvious the transverse positioning of a hermetic compressor for the reason of providing proper lubrication to the hermetic compressor. This is particularly true since, in the present invention, there is no dedicated compartment for the compressor and, since it was necessarily located within the condenser section, a fore and aft disposition of the compressor would have been a more obvious solution because of space limitations.

In respect to the rejection of claims 3-4 and 8-11, the Examiner admits that "Ferdows does not disclose a rotary vane compressor, scroll compressor, configuration of the refrigeration circuit less than 200 mm above the roofline of the bus". He indicates, however, that these features would be an obvious choice for an individual. In response, the applicants contend that these types of compressors are a

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species of a hermetic compressor which, for reasons discussed hereinabove, we believe, patentably distinguishes over the cited reference. Accordingly, these features which are recited in dependent claims should be patentable as well.

In respect to the recited feature in claim 8, relating to the height of the roofline of the bus, the Examiner refers to Fig. 5 of the Ferdows reference. It should be recognized that a single compressor installed in a single rooftop unit to provide the entire compression for the bus is likely to be too large in diameter to meet the minimum height requirements, particularly when considering the fact that an open drive compressor would likely be larger in diameter than a corresponding hermetic compressor. Thus, it would not only be unobvious but likely impossible to obtain the recited height limitation with the design as shown in Fig. 5 of the Ferdows reference.

For the reasons discussed hereinabove, the applicants believe that the claims, as amended, are patentably distinctive over the cited reference. A reconsideration of the Examiner's rejections and a passing of the case to issue is therefore respectfully requested.

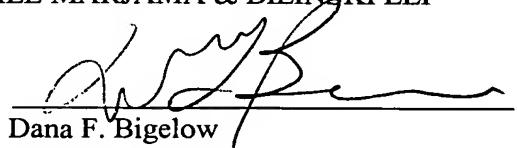
If the Examiner wishes to expedite disposition of the above-captioned patent application, he is invited to contact Applicant's representative at the telephone number below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-0289.

Respectfully submitted,

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AMENDMENTS TO THE DRAWINGS:

The drawings are objected to under 37 CFR 1.83(a) as not showing the “the refrigeration circuit which extends less than about 200 mm above the roofline for the claim 8”. In response, the applicants have amended the claims by insertion of the dimension h in Fig. 5a and by an associated discussion of this feature on page 12 of the specification. Concurrently herewith, a letter to the Official Draftsman is being submitted for purposes of amending Fig. 5a.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes